P. A. CLARK. 2 Sheets—Sheet 1

Oscillating-Pumps.

No. 199,792 Patented Jan. 29, 1878.

Fig. 1.

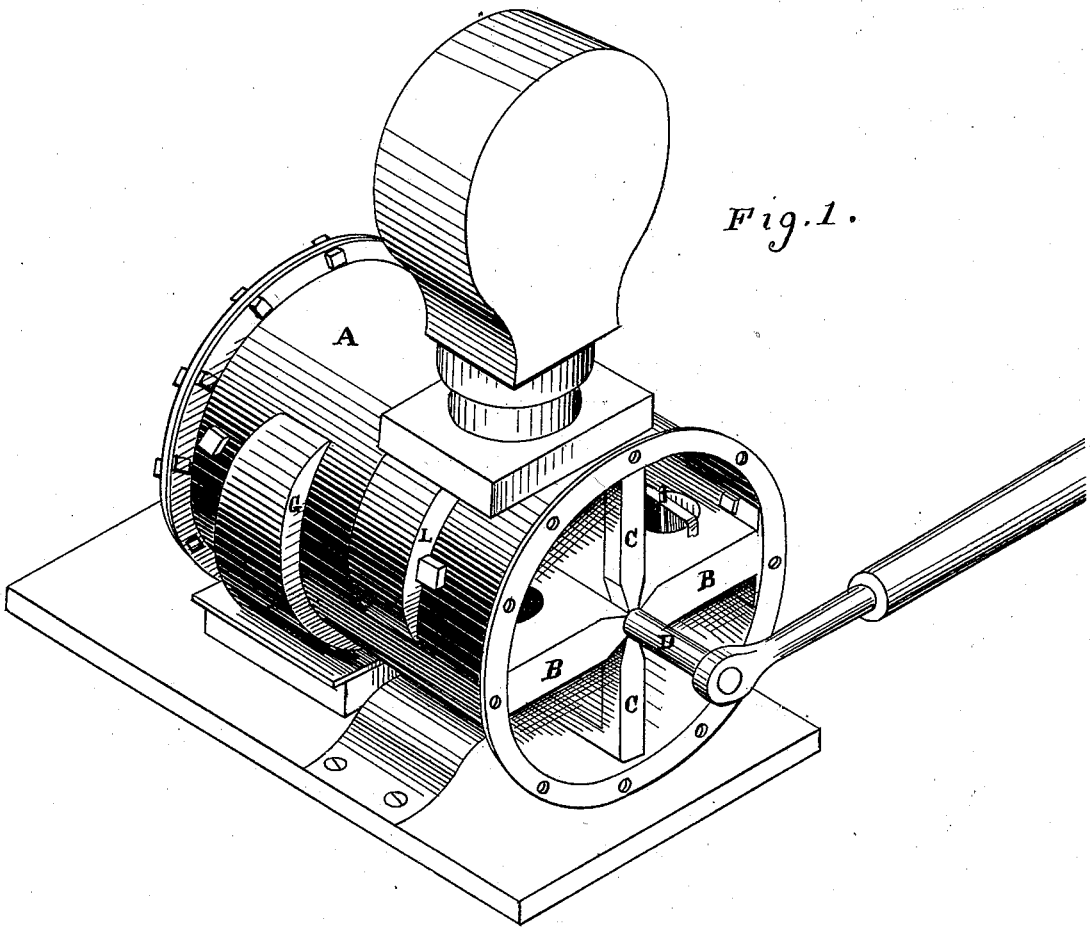
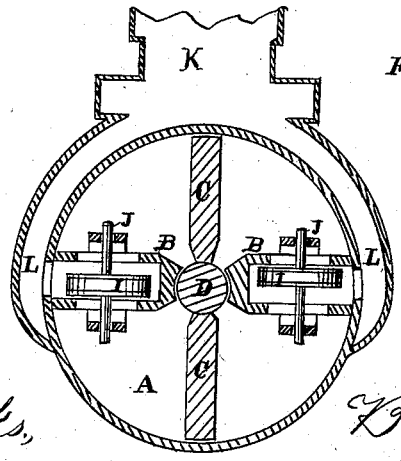


Fig. 2.



Witnesses

Geo. H. Strong.

Frank A. Brooks,

Inventor

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By his attys.

Dewey & Co

2 Sheets—Sheet 2.

P. A. CLARK.

Oscillating-Pumps.

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Fig. 3.

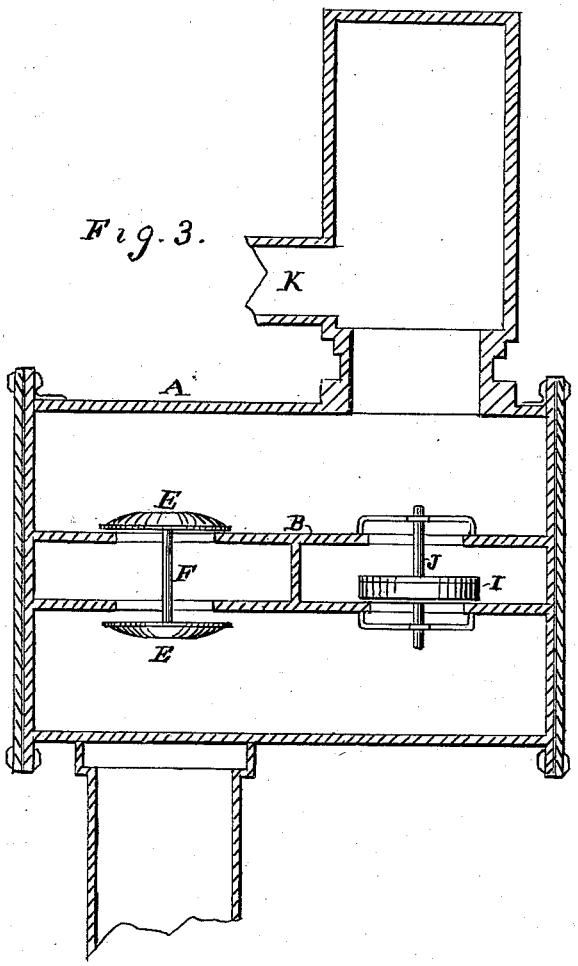
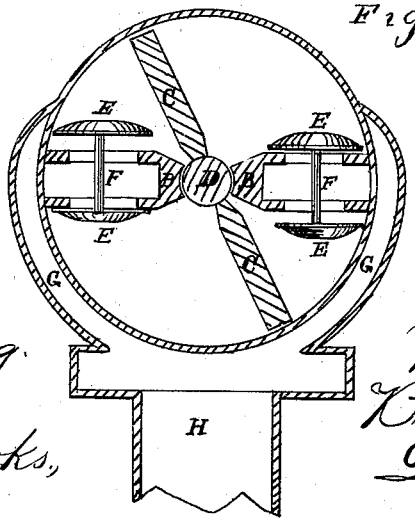


Fig. 4.



Witnesses

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By his Attys

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UNITED STATES PATENT OFFICE.

PHAREZ A. CLARK, OF ANAHEIM, CALIFORNIA.

IMPROVEMENT IN OSCILLATING PUMPS.

Specification forming part of Letters Patent No. **199,792**, dated January 29, 1878; application filed August 10, 1877.

To all whom it may concern:

Be it known that I, PHAREZ ALLEN CLARK, of Anaheim, county of Los Angeles, and State of California, have invented an Improved Quadruple Suction and Force Pump; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to a novel construction for pumps; and it consists of a rocking or oscillating piston moving upon a longitudinal axis in a cylinder which has a diaphragm longitudinally through its center. This diaphragm is so made as to receive two sets of suction-valves and two sets of discharge-valves, which are respectively connected by proper passages with the inlet and outlet pipes.

In the accompanying drawings, Figure 1 is a perspective view with one end of the cylinder removed. Fig. 2 is a transverse section, showing the arrangement of the discharge-valves. Fig. 3 is a longitudinal sectional view of Fig. 1. Fig. 4 is a transverse section, showing the arrangement of the suction-valves.

A is the cylinder of my pump, which may be made with open ends, having suitably-secured heads; but I prefer to cast my cylinder in two parts having flanges, so that the cylinder may be secured by these flanges in the center, while the ends are made solid or cast with the cylinder, and they may be curved or rounded in shape. Horizontally across the cylinder (which I have shown lying on its side) I form a partition or double diaphragm, B, extending from end to end, and this diaphragm has double sides, so that it furnishes water-passages, and also a space for the operation of double-acting valves.

The piston consists of a rectangular plate, C, mounted upon a shaft, D, which extends longitudinally through the axis of the cylinder, and rotates or oscillates in a packed joint just at the meeting edges of the two parts of which the diaphragm B is formed. The piston also has its edges suitably packed, and one half of it works below the diaphragm, while the other half moves above it, being caused to oscillate from side to side by the movement of the axis or shaft D.

The two parts of the diaphragm B are each provided with a partition midway between their ends, so that they are divided into four chambers. Each of these chambers is provided with a double-acting valve, two of these valves being suction and two discharge valves. The suction-valves are composed of two disks, E E, one above and one below the diaphragm, these disks being united by a stem, F, and closing the upper and lower parts alternately from the outside. A passage, G, is formed preferably upon the outside of the cylinder, as shown, and extends from the suction-pipe H up on each side of the cylinder, so as to open into the space between the sides of the diaphragm upon each side of the piston.

It will now be seen that at each movement of the piston water will be drawn into the cylinder above one-half of the diaphragm through the upper half of the valve E E, and also into the portion of the cylinder which is diagonally opposite, through the lower half of the valve upon that side. The opposite halves of each valve will, of course, close the other sides of the cylinder.

The discharge-valves in each half consist of single disks I, with stems J, by which they are guided, and these valves work in the interior of the space within the diaphragm, so as to alternately close each upper and lower port from the inside. This portion of the space within the diaphragm is connected with the exhaust-pipe K by means of passages L, similar to those at G.

The operation of each valve is to close first the lower and then the upper port, so that there are four openings for ingress and four for the discharge of water at each complete or double movement of the piston, each valve doing double duty. As the piston and the diaphragm form four distinct chambers in the cylinder, it will be seen that the two diagonally opposite will be taking in water while the other two are discharging it.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The cylinder A, with its double diaphragm B and double-acting ingress and egress valves E and I, in combination with the piston C, mounted upon the longitudinal shaft so as to

oscillate in the chambers upon each side of the diaphragm, substantially as and for the purpose herein described.

2. The double ingress-valve composed of the disks E E, united by the stem F, and operating alternately upon the outside of openings in the double diaphragm B, substantially as and for the purpose herein described.

3. The discharge-valve I, working within the diaphragm, so as to alternately close the upper and lower discharge-opening, substantially as herein described.

4. The cylinder A, constructed with the semicircular passages G and L, communicating respectively with the ingress-pipe and the suction-chambers in the diaphragm, and with the discharge-pipe and chambers of the diaphragm upon each side, in combination with the double-acting ingress and egress valves, substantially as herein described.

5. The diaphragm B, having its independent valves upon each side of the oscillating shaft so divided as to form four distinct chambers, in combination with valves E and I, so constructed as to perform their duty in both directions, substantially as herein described.

In witness whereof I have hereunto set my hand and seal.

PHAREZ ALLEN CLARK. [L. S.]

Witnesses:

WILLIAM RODMAN OLDEN,

ELI ATHAN PULLEN.